CDC
CENTERS FOR DISEASE CONTROL

June 26, 1992 / Vol. 41 / No. 25

MMWR
MORBIDITY AND MORTALITY WEEKLY REPORT

Epidemiologic Notes and Reports

Primary Amebic Meningoencephalitis – North Carolina, 1991

During September 1991, two children in North Carolina died from primary amebic meningoencephalitis (PAM), a rare and often fatal illness resulting from infection with *Naegleria fowleri*. This report summarizes clinical and epidemiologic information about these two cases and characterizes *N. fowleri* infection.

Patient 1

In September 1991, a previously healthy 3-year-old girl was evaluated by her physician for a 36-hour history of headache and fever; she was lethargic without focal neurologic or meningeal signs. Four hours after evaluation, she became disoriented and did not recognize her parents. When examined at a local emergency department, she was unresponsive to painful stimuli and had fever of 101.8 F (38.8 C). Subsequently, she had a generalized seizure, followed by posturing movements; she was treated with anticonvulsants and tracheally intubated.

Ceftriaxone was initiated for suspected meningitis. She was transferred to a children's hospital, where she responded only to painful stimuli by flexion withdrawal. Computed tomography (CT) of the head without contrast was normal. No organisms were seen on Gram or acid-fast stains of cerebrospinal fluid (CSF); CSF antigen-detection tests were negative for *Haemophilus influenzae* type b, group B *Streptococcus, S. pneumoniae, Neisseria meningitidis*, and *Escherichia coli* K1. CSF red blood cell count (RBC) was 1800 per mm^3; white blood cell count (WBC), 8000 per mm^3; glucose, 41 mg/dL; and protein, 950 mg/dL.

Fourteen hours after admission, the patient developed primary central hyperventilation and anisocoria. Head CT with contrast revealed generalized meningeal enhancement most prominent in the basilar cisterns, with mild hydrocephalus and no brain swelling. Initial bacterial cultures of blood, CSF, and urine were negative.

On the second hospital day, further history revealed that the family, including the patient, had been swimming in a freshwater pond 7 days before the patient's hospitalization. A second CSF specimen obtained 38 hours after admission was

Primary Amebic Meningoencephalitis — Continued

xanthochromic with 17 mg/dL glucose, 3200 mg/dL protein, 500 RBC per mm^3, and 2400 WBC per mm^3. No amebae were seen on Giemsa stain. There was no evidence of brain stem function; brain death was diagnosed on hospital day 4.

Autopsy findings revealed acute PAM caused by *N. fowleri*. Cerebral and spinal cord edema were severe. Sections of the cribriform plate revealed inflammatory infiltration of the nasal mucosa, submucosa, olfactory nerves and dura mater overlying the frontal cortex at the base of the brain.

Additional history during a postmortem conference indicated that 5 days before illness the patient had been learning to swim at the freshwater pond. She stayed primarily in shallow areas and had repeatedly inhaled and swallowed quantities of water.

Patient 2

In September 1991, a previously healthy 4-year-old boy was admitted to a community hospital with a 3-day history of fever to 102 F (38.9 C) and headache. The child had vomited during the 2 days before admission but had remained alert and intermittently playful. On evaluation he was febrile with neck stiffness and positive Kernig's and Brudzinski's signs. CSF contained 77 mg/dL glucose and 150 mg/dL protein, with 123 RBC per mm^3 and 1830 WBC per mm^3. On admission, blood, urine, and CSF cultures were obtained; ceftriaxone was initiated intravenously. Four hours after admission, the patient had brief generalized tonic-clonic seizures. Although anticonvulsant therapy was initiated, he had another brief generalized seizure, after which he remained agitated and intermittently disoriented. He was then transferred to a university medical center.

On admission, additional history revealed that the patient swam in a grassy marsh 18 days before becoming ill. He was afebrile but he remained intermittently disoriented; respiratory distress developed shortly after admission, and a chest radiograph was consistent with aspiration pneumonitis. His respiratory status deteriorated, and he was tracheally intubated. Five hours after admission he developed anisocoria. Head CT showed massive brain swelling. Treatment included hyperventilation, placement of a ventriculostomy, and parenteral dexamethasone.

Despite these efforts, the patient continued to deteriorate. He developed fixed and dilated pupils bilaterally. Spontaneous respirations ceased, and there was no response to painful stimuli. Brain death was diagnosed. Cerebellar brain cuttings during autopsy revealed *N. fowleri* in the subarachnoid space.

Additional history indicated that the patient had been swimming in a freshwater lake 5 days before hospital admission.

Reported by: I Fiordalisi, MD, J Christie, MD, Greenville; C Moffitt, MD, Durham, North Carolina. Div of Parasitic Diseases, National Center for Infectious Diseases, CDC.

Editorial Note: *N. fowleri* is an ameboflagellate from the family Vahlkampfiidae, whose members can transform from amebae to flagellates; either form can cause disease. Although infection with *N. fowleri* is rare, cases have been reported throughout the world (e.g., in Australia, Belgium, Czechoslovakia, Great Britain, India, Ireland, New Zealand, Nigeria, Panama, Puerto Rico, Uganda, and Venezuela). During 1991, in the United States, four patients were reported to have had fatal PAM. *N. fowleri* is most frequently isolated from natural and manmade bodies of warm fresh water. Most cases of PAM occur in previously healthy nonimmunocompromised children or young adults and have been traced to water-related activities during hot summer months.

Primary Amebic Meningoencephalitis — Continued

Amebae invade the central nervous system through the cribriform plate and can be found in the subarachnoid and perivascular spaces. Disease characteristics include inflammation of the olfactory bulbs, progressing rapidly to the cerebral hemispheres, brain stem, posterior fossa, and spinal cord. Symptoms occur within 7 days of exposure, are indistinguishable from fulminant bacterial meningitis, and can include headache, fever, anorexia, vomiting, signs of meningeal inflammation, altered mental status, and coma. Signs of brain stem compression and seizures may ensue. Death typically occurs within 72 hours of onset of symptoms.

CSF findings mimic those of bacterial meningitis, with a predominantly polymorphonuclear leukocytosis and increased protein and decreased glucose concentrations. Occasionally, amebae may be seen on Gram-stained smears. Typically, however, PAM is diagnosed at autopsy. The key to diagnosis during life rests on clinical suspicion based on history. PAM should be suspected in a previously healthy patient with history of exposure to fresh, warm water within 7 days of onset of illness and who has clinical findings characteristic of bacterial meningitis and predominantly basilar distribution of exudate by head CT.

If PAM is suspected, a fresh nonrefrigerated specimen of CSF must be brought directly to the laboratory. If lumbar puncture has already been done and another cannot be performed, inspection of the high-velocity centrifuged preparation made for determination of CSF cell count may be helpful, especially if "atypical mononuclear cells" are reported; such cells actually may be amebae. Although culture of the organism on an agar slant or plate containing *E. coli* or *Enterobacter aerogenes* is possible, most laboratories are not prepared to perform such cultures. Thus, diagnosis depends on microscopic examination of CSF. CSF should be examined in wet-mount preparation as well as with fixation and staining. Dilution of 1 drop of CSF with 1 mL of distilled water will allow transformation of the organism within 1–20 hours from the ameboid to the biflagellate form. For permanently stained preparations, Masson's trichrome stain is optimal as it is generally available and readily demonstrates the ameba's typical nuclear morphology consisting of a prominent central nucleolus without any chromatin lining the nuclear membrane (*1–4*).

Three survivors of PAM have been documented (*5–7*). Successful therapy in these cases appeared related to early diagnosis and administration of intravenous and intrathecal or intraventricular amphotericin B along with intensive supportive care. One surviving patient received miconazole intravenously and intrathecally and rifampin orally (*7*).

In nearly all instances of infection in the United States, several other persons swam in the same water at the same time but did not become ill. The specific behavioral, physiologic, or anatomic risk factors for disease are unknown. More aggressive diagnosis and reporting of disease may assist in clarifying risk factors and in improving therapeutic interventions and possible strategies for prevention.

References

1. Gutierrez Y. The free-living amoebae: *Naegleria* and *Acanthamoeba*. In: Diagnostic pathology of parasitic infections with clinical correlations. Philadelphia: Lea and Fabiger, 1990;80–93.
2. Krogstad DJ, Visvesvara GS, Walls KE, Smith JW. Blood and tissue protozoa. In: Balows A, Hausler WJ Jr, Herrman KL, Isenberg HD, Shadomy HJ, eds. Manual of clinical microbiology. 5th ed. Washington, DC: American Society for Microbiology, 1991;727–50.

3. Martinez AJ, Visvesvara GS. Laboratory diagnosis of pathogenic free-living amoebas: *Naegleria, Acanthamoeba*, and Leptomyxid. Clin Lab Med 1991;11:861–72.
4. Sotela-Avila C. *Naegleria* and *Acanthamoeba*. Free-living amoebas pathogenic for man. Perspect Pediatr Pathol 1987;10:51–85.
5. Apley J, Clarke SKR, Roome APCH, et al. Primary amoebic meningoencephalitis in Britain. Br Med J 1970;1:596–9.
6. Anderson K, Jamieson A. Primary amoebic meningoencephalitis. Lancet 1972;1:902–3.
7. Seidel JS, Harmatz P, Visvesvara GS, et al. Successful treatment of primary amoebic meningoencephalitis. N Engl J Med 1982;306:346–8.

Shigellosis in Child Day Care Centers — Lexington-Fayette County, Kentucky, 1991

In January 1991, the Lexington-Fayette County (Kentucky) Health Department (LFCHD) received three reports of *Shigella sonnei* infections from the University of Kentucky microbiology laboratory. The infections occurred in children aged 2–3 years, each of whom attended a different child day care center in Lexington-Fayette County (population: 200,000). This report summarizes the findings of an investigation by the LFCHD and the Kentucky Department for Health Services to assess the impact of day care center attendance on communitywide shigellosis.

Public health field nurses obtained stool cultures from family members and day care center contacts of the three children; five contacts tested positive for *S. sonnei* infection. Despite health education efforts and follow-up by LFCHD, cases continued to occur throughout the community. From January 1 through July 15, 1991, 186 culture-confirmed *S. sonnei* infections were reported in Lexington-Fayette County.

Investigators attempted to interview an adult member of each family with at least one case of culture-confirmed infection. Questions were asked about the occurrence of diarrhea and child day care center attendance for all household members during January 1 through July 15, 1991. A case of shigellosis was defined as diarrhea (i.e., two or more loose stools per day for 2 or more days) in a person who resided in a household with a person who had culture-confirmed shigellosis. An initial case of shigellosis was defined as the first incidence of diarrhea in a household member.

Of the 186 persons with culture-confirmed infection, 165 (89%) were contacted; these 165 persons represented 109 households, within which 111 initial cases of shigellosis were identified. Of the 64 children aged <6 years with initial cases, 57 (89%) attended licensed day care centers, compared with 44 (67%) of the 66 children who were not initial case-patients (odds ratio=4.1; 95% confidence interval=1.5–11.6).

In 1990, approximately 20,000 children aged <6 years lived in Lexington-Fayette County; the total capacity of licensed day care centers in the county was 7754 children (Urban Research Institute, University of Louisville, Kentucky, unpublished data, 1992). Among children aged <6 years, the rates of initial cases were 7.4 per 1000 children who attended licensed child day care centers and 0.6 per 1000 children of the same age group who did not attend day care centers. The rate of initial cases of shigellosis attributable to child day care center attendance was 6.8 per 1000 children aged <6 years, and the attributable risk percentage* was 91%. Thus, 52 (91%) of the 57 initial

*Incidence among children exposed to day care minus incidence among children not exposed to day care, divided by incidence among children exposed to day care.

Shigellosis — Continued

cases among children aged <6 years in licensed child day care and 47% of the 111 initial cases of all ages were attributed to child day care center attendance.

To control shigellosis, in June 1991, LFCHD created a *Shigella* task force that instituted a diarrhea clinic to facilitate proper diagnosis and treatment, intensified infection-control training and surveillance for shigellosis, and encouraged community-based participation in prevention efforts. Children were monitored in handwashing at day care centers, elementary schools, summer camps, and free-lunch sites. Three weeks after intensive interventions were initiated, the incidence of culture-confirmed cases declined substantially.

Reported by: M Kolanz, J Sandifer, J Poundstone, MD, Shigella Task Force, Lexington-Fayette County; M Stapleton, MSPH, R Finger, MD, State Epidemiologist, Dept for Health Svcs, Kentucky Cabinet for Human Resources. Meningitis and Special Pathogens Br, and Enteric Diseases Br, Div of Bacterial and Mycotic Diseases, National Center for Infectious Diseases, CDC.

Editorial Note: Shigellosis is transmitted by the fecal-oral route; transmission is efficient because the infective dose is low. Minor hygienic indiscretions allow fecal-oral spread from person to person, and many persons with mild illness are in contact with others. As a result, community outbreaks are difficult to control (*1*).

During 1970–1988, the proportion of young children cared for in licensed centers in the United States increased from 3.5% to 22.0% (*2,3*). Child day care center attendance increases the risk for diarrheal disease (*4*). The risk for shigellosis is greatest for children aged <6 years (*5,6*) who are most likely to spread disease to their household members (*6*). Behavior typical in toddlers, including oral exploration of the environment and suboptimal toileting hygiene, may be associated with this risk (*7*).

From 1974 through 1990, 26 cases of *Shigella* infection in Lexington-Fayette County had been the maximum reported in any year. However, a large outbreak with 112 culture-confirmed cases of shigellosis affected the same community in 1972–73 (*5*). In both outbreaks, child day care center attendance was associated with an increased risk for initial cases in households. Secondary attack rates by age group within households were similar in the two outbreaks: for children aged 1–5 years, rates were 47% in 1972–73 and 53% in 1991. However, in 1991, 51% of the initial cases occurred among children aged <6 years who attended a licensed child day care center, compared with 23% in 1972–73. The attributable risk of 91% for day care center attendance among initial cases in young children in 1991 suggests a need for improved infection-control practices in child day care centers.

One of the national health objectives for the year 2000 is to reduce by 25% the number of cases of infectious diarrhea among children who attend licensed day care centers (objective 20.8) (*8*). To decrease the likelihood of transmission of diarrheal illness in day care centers, facility operators should ensure the following:

- Staff and children should be instructed in rigorous and consistent handwashing practices, including the use of soap and running water.
- Staff and children should wash their hands after using the toilet and changing diapers, and before handling, preparing, serving, and eating food. During an outbreak of diarrheal illness, staff and children should also wash their hands on entry to the day care center.

Shigellosis — Continued

- If possible, staff who prepare food (including bottles) should not change diapers or assist children in using the toilet. If they perform both functions, they should practice rigorous handwashing before handling food and after using the toilet, changing diapers, and assisting children with toilet use.
- Surfaces, hard-surface toys, and other fomites should be decontaminated regularly; in the setting of a diarrheal outbreak, this should be done at least once per day.
- Children with diarrhea should be excluded from child day care until they are well.
- In the outbreak setting, where feasible, convalescing children should be placed in a separate room with separate staff and a separate bathroom until they have two stool cultures that are negative for *Shigella* 48 hours or more after completion of a 5-day course of antibiotics (*9*). If cohorting is not feasible, temporary closure of day care centers may be considered to interrupt disease transmission; however, this policy could increase the likelihood of transmission if children are transferred to other centers (*10*).

References

1. CDC. Community outbreaks of shigellosis—United States. MMWR 1990;39:509–13,519.
2. Keyserling MD. Windows on day care. New York: National Council of Jewish Women, 1972:1–3.
3. Dawson DA. Child care arrangements: health of our nation's children—United States, 1988. Hyattsville, Maryland: US Department of Health and Human Services, Public Health Service, CDC, 1990. (Advance data no. 187).
4. Bartlett AV, Moore MD, Gary GW, Starko KM, Erben JJ, Meredith BA. Diarrheal illness among infants and toddlers in child day care centers. J Pediatr 1985;107:495–502.
5. Weissman JB, Schmerler A, Weiler P, Filice G, Godby N, Hansen I. The role of preschool children and day-care centers in the spread of shigellosis in urban communities. J Pediatr 1974;84:797–802.
6. Wilson R, Feldman RA, Davis J, Laventure M. Family illness associated with *Shigella* infection: the interrelationship of age of the index patient and the age of household members in acquisition of illness. J Infect Dis 1981;143:130–2.
7. Pickering LK. The day care center diarrhea dilemma [Editorial]. Am J Public Health 1986;76:623–4.
8. Public Health Service. Healthy people 2000: national health promotion and disease prevention objectives—full report, with commentary. Washington, DC: US Department of Health and Human Services, Public Health Service, 1991; DHHS publication no. (PHS)91-50212.
9. Tauxe RV, Johnson K, Boase J, Helgerson SD, Blake PA. Control of day care shigellosis: a trial of convalescent day care in isolation. Am J Public Health 1986;76:627–30.
10. Tackett CO, Cohen ML. Shigellosis in day care centers: use of plasmid analysis to assess control measures. Pediatr Infect Dis 1983;2:127–9.

Current Trends

Unintentional Firearm-Related Fatalities Among Children and Teenagers — United States, 1982–1988

In 1988, gunshot wounds were the eighth leading cause of unintentional injury deaths among persons in all age groups in the United States and the third leading cause of such deaths among children and teenagers aged 10–19 years (*1*). From 1982

Firearm-Related Fatalities — Continued

through 1988, 3607 children and teenagers aged 0–19 years died from unintentional firearm-related injuries, constituting 32% of all unintentional firearm-related deaths. Of those, 81% occurred among 10–19-year-olds. This article describes a case report of an unintentional firearm-related death of a teenager and summarizes an analysis of demographic and regional differences in unintentional firearm-related mortality among children and teenagers from 1982 through 1988.

Case Report

In a large metropolitan area in the southern United States, two brothers were playing in their home with two friends while the boys' parents were at work. Initially, they played in the boys' bedroom using the bunk beds and bedspreads to build "forts"; they also engaged in gun play using plastic toy guns. Later, they divided into two teams to play hide-and-seek. One of the boys, a 13-year-old, hid in his parents' bedroom where he found his father's 12-gauge shotgun stored under the bed. The shotgun was kept in the house for protection; the boy did not know it was loaded. When his friend, also aged 13 years, entered the room looking for him, the boy who was hiding inadvertently discharged the gun, killing his friend.

Analysis of National Mortality Data

Demographic and regional differences in firearm-related mortality were examined using mortality data compiled by CDC's National Center for Health Statistics. Unintentional firearm-related deaths were identified by the *International Classification of Diseases, Ninth Revision,* code E922. Classification of counties as metropolitan and nonmetropolitan is based on metropolitan statistical areas designated by the U.S. Office of Management and Budget in 1982.

For males aged 10–19 years, the unintentional firearm-related death rate was 10 times that for females (2.0 per 100,000 versus 0.2 per 100,000 children). Males aged 15–19 years were at higher risk (2.4 per 100,000) than were males in any other age group. The risk for dying from an unintentional gunshot wound was similar for black and white children and teenagers aged 10–19 years.

Children and teenagers living in the South* were at greatest risk for dying from an unintentional gunshot wound; those living in the Northeast† were at lowest risk (Table 1). Within regions, white males aged 15–19 years were at greatest risk in the South; in all other regions, death rates were highest for black male teenagers. Overall, children and teenagers living in nonmetropolitan regions were more than twice as likely to die from an unintentional gunshot wound as those living in metropolitan areas; however, the rate ratio in nonmetropolitan and metropolitan areas was 1.4 for black males aged 10–14 years and 1.1 for black males aged 15–19 years (Table 2).

Reported by: Unintentional Injuries Section, Epidemiology Br, and Biometrics Br, Div of Injury Control, National Center for Environmental Health and Injury Control, CDC.

Editorial Note: Despite recent declines in unintentional firearm-related mortality (*1,2*), such injuries continue to disproportionately affect youth nationwide. Unintentional firearm-related injuries are also a major cause of morbidity. For example, a recent report by the General Accounting Office (GAO) estimated that, in 10 U.S. cities during 1989 and 1990, the ratio of nonfatal to fatal unintentional gunshot wounds was 105 to 1 for all age groups combined (*3*). Although the findings of the GAO report cannot be generalized to the entire United States, they underscore the public health impact of unintentional firearm-related injuries.

---

*South Atlantic, East South Central, and West South Central regions.

†New England and Middle Atlantic regions.

Firearm-Related Fatalities — Continued

The high rates of unintentional firearm-related mortality for children and teenagers living in southern and western regions of the country are consistent with the findings of previous reports (*1*). Although most reports have demonstrated a higher death rate for those living in rural areas (*1,4*), one study in Cleveland, Ohio, found rates were higher in urban areas than in the suburbs (*5*).

The findings in this report indicate that, although death rates of unintentional firearm-related injuries were generally higher for children and teenagers living in nonmetropolitan areas, death rates for black males in metropolitan areas approached those in nonmetropolitan areas. Risk factors, such as access to firearms and per capita income, may have a differential impact on unintentional firearm-related mortality. For example, the availability of firearms has been directly associated with unintentional gunshot wounds (*5*), and the relation between per capita income of the area of residence and unintentional firearm-related mortality varies inversely (*1*).

Reduction of morbidity and mortality from unintentional firearm-related injuries among children and teenagers must emphasize limiting access to loaded weapons. Specific behavioral characteristics associated with adolescence, such as impulsivity, feelings of invincibility, and curiosity about firearms, place adolescents at particularly high risk for firearm-related injuries (*6*).

One of the national health objectives for the year 2000 is to reduce by 20% the proportion of households with inappropriately stored weapons (objective 7.11) (*7*). This objective is consistent with the findings of several studies indicating that most unintentional firearm-related deaths involving children occur at a residence (*4,8,9*) and involve inappropriately stored weapons (*9*). Appropriate storage should include

TABLE 1. Number and rate* of unintentional firearm-related deaths, by region, age, race, and sex — United States, 1982–1988

	Northeast†		South§		Midwest¶		West**		Total	
Age group (yrs)	**No.**	**Rate**	**No.**	**Rate**	**No.**	**Rate**	**No.**	**Rate**	**No.**	**Rate**
10–14										
White										
Male	71	0.7	470	2.9	183	1.4	167	1.7	**891**	**1.8**
Female	11	0.1	52	0.3	25	0.2	26	0.3	**114**	**0.2**
Black										
Male	1	0.1	65	1.3	19	1.0	14	1.9	**99**	**1.1**
Female	1	0.1	17	0.3	4	0.2	3	0.4	**25**	**0.3**
Total††	**84**	**0.4**	**606**	**1.4**	**236**	**0.8**	**222**	**1.0**	**1148**	**1.0**
15–19										
White										
Male	132	1.1	630	3.6	271	1.8	273	2.5	**1306**	**2.4**
Female	14	0.1	57	0.3	19	0.1	20	0.2	**110**	**0.2**
Black										
Male	28	1.5	125	2.4	52	2.7	54	6.3	**259**	**2.6**
Female	2	0.1	18	0.3	3	0.2	8	1.0	**31**	**0.3**
Total††	**177**	**0.6**	**840**	**1.8**	**354**	**1.1**	**391**	**1.5**	**1762**	**1.3**

*Per 100,000 children and teenagers.
†New England and Middle Atlantic regions.
§South Atlantic, East South Central, and West South Central regions.
¶East North Central and West North Central regions.
**Mountain and Pacific regions.
††Includes all races.

Firearm-Related Fatalities — Continued

TABLE 2. Number and rate* of unintentional firearm-related deaths, by metropolitan area, age, race, and sex — United States, 1982–1988

	Metropolitan area		Nonmetropolitan area	
Age group (yrs)	No.	Rate	No.	Rate
10–14				
White				
Male	473	1.3	418	3.1
Female	63	0.2	51	0.4
Black				
Male	74	1.0	25	1.4
Female	16	0.2	9	0.5
Total†	**630**	**0.7**	**518**	**1.7**
15–19				
White				
Male	773	1.9	533	3.8
Female	59	0.2	51	0.4
Black				
Male	204	2.6	55	2.8
Female	26	0.3	5	0.3
Total†	**1081**	**1.1**	**681**	**2.1**

*Per 100,000 children and teenagers.
†Includes all races.

locked and separate storage of weapons and ammunition. In Florida and California, legislation has been enacted to make adults legally responsible for inappropriate storage.

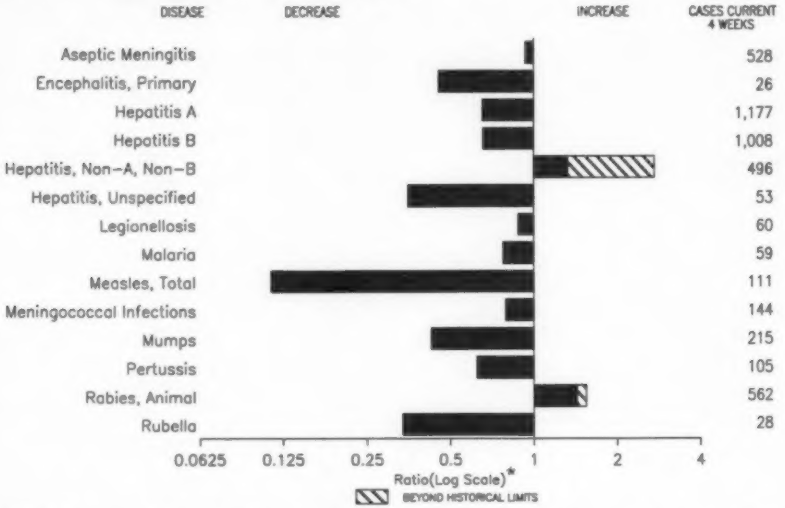
Modifying firearms and ammunition to render them less lethal has also been advocated as a prevention strategy (*1,10*). The addition of child-proof safety devices would prevent children aged <6 years from discharging a firearm, and the use of loading indicators could prevent an estimated 23% of all unintentional firearm-related deaths (*3*). Regulation to control the amount of gunpowder and the shape and jacketing of ammunition may reduce the severity of nonfatal firearm-related injuries (*1,10*).

References

1. Baker SP, O'Neill B, Ginsburg MJ, Li G. The injury fact book. 2nd ed. New York: Oxford University Press, 1992.
2. Wood NP Jr, Mercy JA. Unintentional firearm-related fatalities, 1970–1984. In: CDC surveillance summaries, February 1988. MMWR 1988;37(no. SS-1):47–52.
3. US General Accounting Office. Accidental shootings: many deaths and injuries caused by firearms could be prevented—report to the Chairman, Subcommittee on Antitrust, Monopolies, and Business Rights, Committee on the Judiciary, House of Representatives. Washington, DC: US General Accounting Office, 1991; report no. GAO/PEMD-91-9.
4. Keck NJ, Istre GR, Coury DL, Jordan F, Eaton AP. Characteristics of fatal gunshot wounds in the home in Oklahoma: 1982–1983. Am J Dis Child 1988;142:623–6.
5. Rushforth NB, Hirsch CS, Ford AB, Adelson L. Accidental firearm fatalities in a metropolitan county (1958–1973). Am J Epidemiol 1975;100:499–505.
6. Committee on Adolescence, American Academy of Pediatrics. Firearms and adolescents. AAP News 1992;(January):20–1.
7. Public Health Service. Healthy people 2000: national health promotion and disease prevention objectives—full report, with commentary. Washington, DC: US Department of Health and Human Services, Public Health Service, 1991; DHHS publication no. (PHS)91-50212.

(Continued on page 451)

FIGURE I. Notifiable disease reports, comparison of 4-week totals ending June 20, 1992, with historical data — United States



*Ratio of current 4-week total to mean of 15 4-week totals (from previous, comparable, and subsequent 4-week periods for the past 5 years). The point where the hatched area begins is based on the mean and two standard deviations of these 4-week totals.

TABLE I. Summary — cases of specified notifiable diseases, United States, cumulative, week ending June 20, 1992 (25th Week)

	Cum. 1992		Cum. 1992
AIDS*	20,284	Measles: imported	74
Anthrax	-	indigenous	1,044
Botulism: Foodborne	8	Plague	2
Infant	25	Poliomyelitis, Paralytic†	-
Other	-	Psittacosis	45
Brucellosis	30	Rabies, human	-
Cholera	36	Syphilis, primary & secondary	15,988
Congenital rubella syndrome	5	Syphilis, congenital, age < 1 year§	697
Diphtheria	3	Tetanus	7
Encephalitis, post-infectious	64	Toxic shock syndrome	121
Gonorrhea	224,248	Trichinosis	16
Haemophilus influenzae (invasive disease)	748	Tuberculosis	9,492
Hansen Disease	66	Tularemia	47
Leptospirosis	15	Typhoid fever	149
Lyme Disease	1,944	Typhus fever, tickborne (RMSF)	114

*Updated monthly; last update May 30, 1992.
†Two cases of suspected poliomyelitis have been reported in 1992; 6 of the 9 suspected cases with onset in 1991 were confirmed and 5 of the 8 suspected cases with onset in 1990 were confirmed; all were vaccine associated.
§Updates for first quarter 1992.

TABLE II. Cases of selected notifiable diseases, United States, weeks ending June 20, 1992, and June 22, 1991 (25th Week)

Reporting Area	AIDS*	Aseptic Meningitis	Encephalitis		Gonorrhea		Hepatitis (Viral), by type				Legionellosis	Lyme Disease
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	Cum. 1992	Cum. 1992	Cum. 1992	Cum. 1992	Cum. 1992	Cum. 1991	Cum. 1992	Cum. 1992	Cum. 1992	Cum. 1992	Cum. 1992	Cum. 1992
UNITED STATES	20,284	2,523	238	64	224,248	273,181	9,217	7,538	3,649	331	600	1,944
NEW ENGLAND	681	128	15	-	4,701	6,931	287	278	33	19	35	222
Maine	27	12	-	-	40	68	28	13	4	-	1	-
N.H.	22	5	2	-	7	154	22	20	11	1	3	9
Vt.	9	5	2	-	13	23	4	6	4	-	2	2
Mass.	382	51	8	-	1,683	2,918	139	211	11	18	19	42
R.I.	41	55	3	-	362	570	62	15	3	-	10	50
Conn.	200	-	-	-	2,596	3,198	32	13	-	-	-	119
MID. ATLANTIC	4,844	269	15	7	22,274	33,544	685	963	178	13	180	1,336
Upstate N.Y.	642	124	-	-	4,579	5,542	176	227	114	6	75	891
N.Y. City	2,651	50	4	1	6,858	13,476	235	160	3	-	3	-
N.J.	1,041	-	-	-	3,144	5,115	100	239	43	-	22	134
Pa.	510	95	11	6	7,693	9,411	174	337	18	7	80	311
E.N. CENTRAL	1,911	348	66	12	41,987	51,301	1,216	1,127	620	19	136	47
Ohio	388	96	23	1	11,773	15,565	220	123	56	4	67	21
Ind.	194	43	7	-	4,016	5,031	386	414	311	5	12	16
Ill.	808	70	17	6	14,409	15,723	226	95	28	3	8	3
Mich.	401	132	18	5	10,096	11,497	70	311	201	7	32	7
Wis.	120	7	1	-	1,693	3,485	314	184	24	-	17	-
W.N. CENTRAL	585	160	15	4	9,958	13,190	1,102	391	183	22	38	63
Minn.	101	13	1	-	1,342	1,330	333	31	12	2	2	6
Iowa	46	21	-	2	740	932	20	18	4	2	10	7
Mo.	306	77	8	-	5,158	8,117	354	292	150	17	13	44
N. Dak.	1	1	1	-	33	28	57	1	3	1	1	1
S. Dak.	3	5	-	1	84	162	168	4	-	-	-	-
Nebr.	19	10	2	1	8	875	82	12	5	-	11	1
Kans.	109	33	3	-	2,563	1,746	88	33	9	-	1	4
S. ATLANTIC	4,849	515	44	30	72,799	81,394	567	1,225	472	46	91	124
Del.	53	20	4	-	759	1,117	20	121	92	1	15	57
Md.	561	63	9	-	7,010	8,281	109	191	20	6	16	23
D.C.	387	12	1	-	3,535	4,757	11	45	198	-	7	-
Va.	275	86	10	8	8,657	8,250	51	88	16	15	10	24
W. Va.	25	3	3	-	419	565	4	27	3	9	-	1
N.C.	306	55	13	-	11,313	15,102	41	184	42	-	11	6
S.C.	165	6	-	-	5,026	5,823	12	26	-	-	16	-
Ga.	641	64	2	-	23,200	20,605	68	157	47	-	5	2
Fla.	2,436	206	2	22	[illegible]	16,894	251	386	54	15	11	11
E.S. CENTRAL	622	145	9	-	22,527	25,333	143	633	1,107	1	25	27
Ky.	82	48	6	-	2,345	2,711	38	36	1	-	14	7
Tenn.	190	43	1	-	6,881	9,592	66	534	1,099	-	9	17
Ala.	229	40	1	-	7,843	6,411	23	61	7	1	2	3
Miss.	121	14	1	-	5,458	6,619	16	2	-	-	-	-
W.S. CENTRAL	1,812	303	20	4	24,233	31,247	889	946	59	76	9	38
Ark.	95	4	7	-	3,806	3,509	48	38	5	3	-	6
La.	320	18	2	1	5,713	7,811	60	71	23	2	-	1
Okla.	100	-	1	2	2,340	3,174	103	98	20	2	4	13
Tex.	1,297	281	10	1	12,374	16,753	678	739	11	69	5	18
MOUNTAIN	595	81	11	3	5,327	5,838	1,346	342	138	30	43	2
Mont.	9	-	1	1	51	54	38	21	27	-	7	-
Idaho	13	12	-	-	59	73	30	42	3	-	3	1
Wyo.	2	-	-	-	28	53	3	2	5	-	1	-
Colo.	217	21	6	1	1,832	1,678	392	52	47	14	8	-
N. Mex.	52	8	3	-	432	539	129	104	13	7	2	-
Ariz.	159	24	1	-	1,977	2,201	571	62	14	4	12	-
Utah	46	-	-	1	116	154	148	8	18	5	2	1
Nev.	97	16	-	-	832	1,086	35	51	11	-	8	-
PACIFIC	4,385	574	43	4	20,442	24,403	2,982	1,633	859	105	43	85
Wash.	217	-	-	-	1,809	2,182	333	159	68	6	5	2
Oreg.	130	-	-	-	737	968	180	146	39	6	-	-
Calif.	3,971	524	40	3	17,315	20,592	2,316	1,317	609	87	37	83
Alaska	8	3	3	-	359	348	25	6	2	1	-	-
Hawaii	59	47	-	1	222	313	128	5	141	5	1	-
Guam	-	-	-	-	36	-	5	1	-	2	-	1
P.R.	735	73	1	-	84	326	14	187	44	13	1	-
V.I.	2	-	-	-	54	249	2	4	-	-	-	-
Amer. Samoa	-	-	-	-	17	22	-	1	-	-	-	-
C.N.M.I.	-	-	-	-	25	27	-	-	-	-	-	-

N: Not notifiable U: Unavailable C.N.M.I.: Commonwealth of the Northern Mariana Islands
*Updated monthly; last update May 30, 1992.

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending June 20, 1992, and June 22, 1991 (25th Week)

Reporting Area	Malaria	Measles (Rubeola)					Meningococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total									
	Cum. 1992	1992	Cum. 1992	1992	Cum. 1992	Cum. 1991	Cum. 1992	1992	Cum. 1992	1992	Cum. 1992	Cum. 1991	1992	Cum. 1992	Cum. 1991
UNITED STATES	364	25	1,044	-	74	7,056	1,217	52	1,481	53	663	1,039	6	105	982
NEW ENGLAND	20	4	38	-	7	47	74	1	10	1	65	172	1	6	2
Maine	-	-	-	-	-	-	7	-	-	-	2	44	1	1	-
N.H.	3	4	14	-	-	-	5	1	2	-	18	12	-	-	1
Vt.	-	-	-	-	-	5	2	-	-	1	1	3	-	-	-
Mass.	10	-	5	-	3	17	28	-	2	-	33	98	-	-	1
R.I.	4	-	19	-	-	2	-	-	-	-	-	-	-	4	-
Conn.	3	-	-	-	4	23	32	-	6	-	11	15	-	1	-
MID. ATLANTIC	103	-	158	-	8	4,154	135	1	98	3	69	107	-	15	557
Upstate N.Y.	15	-	76	-	2	329	68	-	44	-	22	62	-	11	534
N.Y. City	56	-	33	-	5	1,425	11	-	12	-	7	10	-	-	2
N.J.	17	-	44	-	1	989	17	-	11	-	14	9	-	3	-
Pa.	15	-	5	-	-	1,411	39	1	31	3	26	26	-	1	21
E.N. CENTRAL	20	-	23	-	9	74	179	11	183	9	52	187	-	5	164
Ohio	3	-	2	-	3	1	45	8	72	8	26	62	-	-	147
Ind.	4	-	19	-	-	1	26	-	7	-	12	37	-	-	1
Ill.	5	-	1	-	4	24	49	-	49	-	5	40	-	5	4
Mich.	7	-	1	-	1	39	45	3	53	1	3	22	-	-	11
Wis.	1	-	-	-	1	9	14	-	2	-	6	26	-	-	1
W.N. CENTRAL	22	1	6	-	3	34	74	8	59	3	50	70	-	4	15
Minn.	8	1	4	-	2	8	7	7	14	2	17	25	-	-	6
Iowa	2	-	-	-	1	15	7	-	9	-	1	8	-	-	5
Mo.	9	-	1	-	-	-	33	-	28	-	18	24	-	-	4
N. Dak.	-	U	-	U	-	-	-	U	2	U	7	1	U	-	-
S. Dak.	1	-	-	-	-	-	1	-	-	1	4	1	-	-	-
Nebr.	-	-	-	-	-	-	12	1	4	-	2	5	-	-	-
Kans.	2	-	1	-	-	11	14	-	2	-	1	6	-	4	-
S. ATLANTIC	72	1	112	-	10	411	208	20	590	2	65	87	-	11	5
Del.	4	-	3	-	-	21	2	-	4	-	-	-	-	-	-
Md.	18	-	8	-	7	163	22	9	55	-	14	14	-	7	1
D.C.	6	-	-	-	-	-	-	-	3	-	-	-	-	1	1
Va.	16	-	8	-	3	24	36	-	33	-	4	10	-	-	-
W. Va.	-	-	-	-	-	-	15	-	22	-	2	6	-	-	-
N.C.	6	-	25	-	-	31	32	-	124	-	13	15	-	-	-
S.C.	-	-	29	-	-	12	18	-	46	-	9	9	-	-	-
Ga.	3	-	-	-	-	14	30	2	56	2	8	21	-	-	-
Fla.	19	1	39	-	-	146	53	9	247	-	15	12	-	3	3
E.S. CENTRAL	12	18	436	-	17	1	84	1	39	-	12	27	-	1	83
Ky.	1	18	434	-	1	-	26	-	-	-	-	-	-	-	-
Tenn.	7	-	-	-	-	1	26	-	14	-	5	13	-	1	83
Ala.	4	-	-	-	-	-	26	1	7	-	7	14	-	-	-
Miss.	-	-	2	-	16	-	6	-	18	-	-	-	-	-	-
W.S. CENTRAL	11	-	185	-	-	38	94	2	265	-	22	22	-	-	1
Ark.	-	-	-	-	-	5	8	-	6	-	9	2	-	-	1
La.	-	-	-	-	-	-	20	-	15	-	-	9	-	-	-
Okla.	2	-	11	-	-	-	11	1	15	-	13	11	-	-	-
Tex.	9	-	174	-	-	33	55	1	229	-	-	-	-	-	-
MOUNTAIN	10	-	2	-	6	715	64	1	77	14	119	117	1	4	4
Mont.	-	-	-	-	-	-	12	-	2	-	1	-	-	-	-
Idaho	-	-	-	-	-	240	8	-	2	-	14	20	-	1	-
Wyo.	-	-	1	-	-	-	2	-	-	-	-	3	-	-	-
Colo.	4	-	1	-	6	5	11	-	5	-	20	61	-	-	1
N. Mex.	1	-	-	-	-	93	5	N	N	4	31	10	-	-	1
Ariz.	4	-	-	-	-	312	14	-	47	-	37	8	1	2	-
Utah	-	-	-	-	-	49	4	1	16	10	15	13	-	1	-
Nev.	1	U	-	U	-	16	8	U	5	U	1	2	U	-	2
PACIFIC	94	1	84	-	14	1,582	306	7	160	21	209	250	4	59	151
Wash.	6	-	-	-	10	4	39	-	8	5	56	62	-	6	-
Oreg.	8	-	4	-	1	55	45	N	N	1	14	37	-	2	2
Calif.	74	-	42	-	-	1,506	210	7	141	15	129	107	2	36	144
Alaska	1	-	8	-	1	1	6	-	1	-	-	11	-	-	-
Hawaii	5	1	30	-	2	16	5	-	10	-	10	33	2	15	5
Guam	1	U	10	U	-	-	-	U	6	U	-	-	U	1	-
P.R.	-	-	5	-	-	81	3	-	1	-	8	16	-	-	1
V.I.	-	-	-	-	-	2	-	-	13	-	-	-	-	-	-
Amer. Samoa	-	U	-	U	-	24	-	U	-	U	6	-	U	-	-

*For measles only, imported cases includes both out-of-state and international importations.
N: Not notifiable U: Unavailable †International §Out-of-state

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending June 20, 1992, and June 22, 1991 (25th Week)

Reporting Area	Syphilis (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1992	Cum. 1991	Cum. 1992	Cum. 1992	Cum. 1991	Cum. 1992	Cum. 1992	Cum. 1992	Cum. 1992
UNITED STATES	15,988	20,499	121	9,492	10,211	47	149	114	3,845
NEW ENGLAND	282	534	10	208	289	-	17	2	364
Maine	-	-	-	48	25	-	-	-	-
N.H.	-	12	6	-	-	-	1	-	1
Vt.	1	1	-	3	3	-	-	-	16
Mass.	142	253	3	74	141	-	11	1	3
R.I.	16	24	1	24	33	-	-	1	-
Conn.	123	244	-	59	87	-	5	-	344
MID. ATLANTIC	2,276	3,750	14	2,224	2,413	-	43	5	1,105
Upstate N.Y.	161	328	5	155	261	-	6	1	615
N.Y. City	1,154	1,787	-	1,394	1,437	-	18	3	-
N.J.	319	660	-	383	396	-	12	-	344
Pa.	642	975	9	292	319	-	7	1	146
E.N. CENTRAL	2,309	2,292	35	997	1,045	-	14	12	65
Ohio	334	300	10	150	144	-	3	8	6
Ind.	144	73	8	82	80	-	-	2	6
Ill.	1,098	1,117	5	489	566	-	10	-	10
Mich.	460	552	12	233	209	-	1	1	7
Wis.	273	250	-	43	46	-	-	1	36
W.N. CENTRAL	531	339	18	180	256	16	2	8	655
Minn.	41	38	3	47	46	-	-	-	100
Iowa	18	30	4	19	33	-	-	-	110
Mo.	389	227	4	57	113	13	2	7	8
N. Dak.	1	1	1	2	6	-	-	-	68
S. Dak.	-	1	-	15	20	2	-	-	60
Nebr.	1	7	3	13	9	1	-	-	5
Kans.	81	35	3	27	29	-	-	1	304
S. ATLANTIC	4,528	6,090	13	1,857	1,839	3	11	25	850
Del.	97	77	3	19	16	-	-	3	119
Md.	348	497	1	121	175	1	2	1	244
D.C.	209	385	-	59	104	-	1	1	10
Va.	347	507	1	124	158	2	-	1	141
W. Va.	7	17	1	30	39	-	1	1	19
N.C.	1,079	913	3	248	227	-	-	11	2
S.C.	625	718	1	192	199	-	1	2	66
Ga.	951	1,479	1	423	336	-	-	3	179
Fla.	865	1,497	2	641	585	-	6	2	70
E.S. CENTRAL	2,125	2,209	1	565	699	6	2	22	70
Ky.	49	37	-	180	154	1	-	1	38
Tenn.	585	762	1	90	203	5	-	20	-
Ala.	855	799	-	202	196	-	-	1	32
Miss.	636	611	-	93	146	-	2	-	-
W.S. CENTRAL	2,906	3,623	1	932	1,166	13	5	36	406
Ark.	387	323	-	82	97	7	-	5	19
La.	1,231	1,190	-	87	89	-	-	-	-
Okla.	123	87	-	68	70	6	-	31	197
Tex.	1,165	2,023	1	695	910	-	5	-	190
MOUNTAIN	191	279	10	246	262	9	2	3	74
Mont.	3	2	-	-	3	5	-	1	10
Idaho	1	3	1	12	4	-	1	-	-
Wyo.	1	3	-	-	2	2	-	-	24
Colo.	24	45	4	16	6	-	1	-	2
N. Mex.	19	14	1	39	31	2	-	1	4
Ariz.	97	184	2	112	153	-	-	-	32
Utah	5	4	2	38	25	-	-	1	1
Nev.	41	24	-	29	38	-	-	-	1
PACIFIC	840	1,383	19	2,283	2,242	-	53	1	256
Wash.	49	91	-	146	142	-	4	-	-
Oreg.	24	37	-	49	50	-	-	-	-
Calif.	761	1,248	19	1,943	1,916	-	46	1	244
Alaska	2	3	-	30	37	-	-	-	12
Hawaii	4	4	-	115	97	-	3	-	-
Guam	2	-	-	34	-	-	1	-	-
P.R.	146	230	-	120	94	-	1	-	25
V.I.	31	61	-	3	1	-	-	-	-
Amer. Samoa	-	-	-	-	2	-	1	-	-
C.N.M.I.	4	-	-	12	6	-	1	-	-

U: Unavailable

TABLE III. Deaths in 121 U.S. cities,* week ending June 20, 1992 (25th Week)

Reporting Area	All Causes, By Age (Years)						P&I†
	All Ages	≥65	45-64	25-44	1-24	<1	Total
NEW ENGLAND	565	374	109	48	17	17	52
Boston, Mass.	141	83	28	17	5	8	22
Bridgeport, Conn.	53	40	6	3	1	3	2
Cambridge, Mass.	19	15	4	-	-	-	1
Fall River, Mass.	27	20	6	1	-	-	2
Hartford, Conn.	54	34	9	7	1	3	-
Lowell, Mass.	19	14	2	2	1	-	2
Lynn, Mass.	20	10	4	4	2	-	1
New Bedford, Mass.	29	22	6	1	-	-	1
New Haven, Conn.	38	23	10	4	-	1	4
Providence, R.I.	33	28	4	1	-	-	2
Somerville, Mass.	7	6	-	-	1	-	-
Springfield, Mass.	51	30	13	3	4	1	5
Waterbury, Conn.	26	18	8	-	-	-	2
Worcester, Mass.	48	31	9	5	2	1	8
MID. ATLANTIC	2,438	1,551	456	302	71	58	108
Albany, N.Y.	38	25	7	2	1	3	-
Allentown, Pa.	22	19	2	1	-	-	3
Buffalo, N.Y.	100	73	18	5	-	4	3
Camden, N.J.	34	17	4	7	3	3	-
Elizabeth, N.J.	33	23	7	3	-	-	-
Erie, Pa.§	35	27	7	-	1	-	-
Jersey City, N.J.	61	36	10	9	3	3	1
New York City, N.Y.	1,251	756	241	201	29	24	53
Newark, N.J.	53	23	14	13	3	-	3
Paterson, N.J.	44	25	7	9	2	1	-
Philadelphia, Pa.	296	187	63	22	12	12	17
Pittsburgh, Pa.§	107	74	26	3	2	2	7
Reading, Pa.	18	16	1	-	1	-	2
Rochester, N.Y.	123	91	14	12	4	2	8
Schenectady, N.Y.	39	16	10	7	5	1	1
Scranton, Pa.§	29	24	3	2	-	-	-
Syracuse, N.Y.	70	51	11	4	3	1	3
Trenton, N.J.	31	23	7	1	-	-	4
Utica, N.Y.	19	18	-	1	-	-	1
Yonkers, N.Y.	35	27	4	-	2	2	2
E.N. CENTRAL	1,831	1,134	350	163	109	75	76
Akron, Ohio	54	31	14	1	6	2	-
Canton, Ohio	29	21	6	1	-	1	4
Chicago, Ill.	330	116	62	59	72	21	6
Cincinnati, Ohio	120	74	25	14	5	2	11
Cleveland, Ohio	147	89	29	22	3	4	3
Columbus, Ohio	180	117	45	7	2	9	8
Dayton, Ohio	108	79	21	3	2	3	8
Detroit, Mich.	235	142	42	28	7	16	4
Evansville, Ind.	50	37	10	-	1	2	-
Fort Wayne, Ind.	49	34	7	3	-	5	-
Gary, Ind.	17	11	4	2	-	-	-
Grand Rapids, Mich.	66	49	15	1	1	-	8
Indianapolis, Ind.	U	U	U	U	U	U	U
Madison, Wis.	25	18	4	2	1	-	-
Milwaukee, Wis.	103	79	19	3	1	1	6
Peoria, Ill.	51	39	7	3	-	2	2
Rockford, Ill.	52	37	7	5	2	1	2
South Bend, Ind.	51	38	10	3	-	-	4
Toledo, Ohio	99	72	15	5	3	4	6
Youngstown, Ohio	65	51	8	1	3	2	4
W.N. CENTRAL	729	521	130	40	18	20	34
Des Moines, Iowa	64	42	15	4	2	1	2
Duluth, Minn.	28	21	6	1	-	-	-
Kansas City, Kans.	31	15	10	4	1	1	-
Kansas City, Mo.	106	72	21	4	5	4	5
Lincoln, Nebr.	32	28	2	1	1	-	5
Minneapolis, Minn.	150	109	22	14	4	1	6
Omaha, Nebr.	89	60	17	5	1	6	5
St. Louis, Mo.	114	82	22	4	2	4	4
St. Paul, Minn.	61	54	5	2	-	-	4
Wichita, Kans.	54	38	10	1	2	3	3
S. ATLANTIC	1,114	641	232	158	51	30	65
Atlanta, Ga.	104	50	25	25	3	1	1
Baltimore, Md.	196	111	43	30	6	5	17
Charlotte, N.C.	76	48	12	9	2	5	3
Jacksonville, Fla.	111	75	16	13	5	2	6
Miami, Fla.	56	34	14	6	-	2	2
Norfolk, Va.	55	35	11	3	-	6	5
Richmond, Va.	87	54	21	10	1	1	4
Savannah, Ga.	46	30	11	4	1	-	1
St. Petersburg, Fla.	66	52	6	4	1	3	-
Tampa, Fla.	173	102	43	17	8	2	21
Washington, D.C.	120	31	26	36	24	3	5
Wilmington, Del.	24	19	4	1	-	-	-
E.S. CENTRAL	596	367	125	46	35	23	44
Birmingham, Ala.	102	58	23	12	6	3	1
Chattanooga, Tenn.	50	37	7	3	3	-	4
Knoxville, Tenn.	57	37	12	5	1	2	6
Louisville, Ky.	U	U	U	U	U	U	U
Memphis, Tenn.	133	75	34	8	16	-	14
Mobile, Ala.	64	39	12	4	1	8	2
Montgomery, Ala.	41	28	4	2	2	5	3
Nashville, Tenn.	149	93	33	12	6	5	14
W.S. CENTRAL	1,450	896	307	149	60	38	81
Austin, Tex.	57	34	14	5	2	2	3
Baton Rouge, La.	51	36	8	5	1	1	4
Corpus Christi, Tex.	32	24	6	-	1	1	2
Dallas, Tex.	204	106	54	27	11	6	6
El Paso, Tex.	51	32	14	4	-	1	4
Ft. Worth, Tex.	114	74	24	9	6	1	8
Houston, Tex.	347	208	77	37	12	13	26
Little Rock, Ark.	74	45	17	9	1	2	4
New Orleans, La.	108	69	19	17	2	1	-
San Antonio, Tex.	241	148	48	22	17	6	11
Shreveport, La.	71	54	11	6	-	-	6
Tulsa, Okla.	100	66	15	8	7	4	7
MOUNTAIN	775	504	149	81	25	16	53
Albuquerque, N.M.	80	58	6	12	3	1	3
Colo. Springs, Colo.	50	30	11	6	3	-	1
Denver, Colo.	87	54	18	10	4	1	10
Las Vegas, Nev.	138	80	37	14	5	2	6
Ogden, Utah	16	12	1	1	1	1	-
Phoenix, Ariz.	185	113	37	23	4	8	15
Pueblo, Colo.	13	11	2	-	-	-	-
Salt Lake City, Utah	87	58	15	8	3	3	9
Tucson, Ariz.	119	88	22	7	2	-	9
PACIFIC	2,008	1,289	384	214	77	34	110
Berkeley, Calif.	21	16	1	2	1	1	2
Fresno, Calif.	68	40	16	9	2	1	6
Glendale, Calif.	24	17	5	-	2	-	-
Honolulu, Hawaii	82	59	16	4	2	1	9
Long Beach, Calif.	64	34	21	6	3	-	9
Los Angeles, Calif.	638	383	120	89	34	5	29
Pasadena, Calif.	27	15	8	-	2	2	3
Portland, Oreg.	130	92	24	8	2	4	6
Sacramento, Calif.	149	106	21	13	6	3	6
San Diego, Calif.	186	119	37	16	6	5	16
San Francisco, Calif.	169	90	39	34	5	1	5
San Jose, Calif.	139	89	32	7	5	6	8
Santa Cruz, Calif.	39	34	2	3	-	-	-
Seattle, Wash.	129	91	19	12	5	2	2
Spokane, Wash.	53	40	10	3	-	-	3
Tacoma, Wash.	90	64	13	8	2	3	6
TOTAL	11,506¶	7,277	2,242	1,201	463	311	623

*Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.
†Pneumonia and influenza.
§Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.
¶Total includes unknown ages.
U: Unavailable

Firearm-Related Fatalities — Continued

8. Wintemute GJ, Kraus JF, Teret SP, Wright MA. Unintentional firearm deaths in California. J Trauma 1989;29:457–61.
9. Beaver BL, Moore VL, Peclet M, Haller JA Jr, Smialek J, Hill JL. Characteristics of pediatric firearm fatalities. J Pediatr Surg 1990;25:97–100.
10. Christoffel KK. Toward reducing pediatric injuries from firearms: charting a legislative and regulatory course. Pediatrics 1991;88:294–305.

Effectiveness in Disease and Injury Prevention

Fireworks-Related Injuries — Marion County, Indiana, 1986–1991

Based on data from the Consumer Product Safety Commission's (CPSC) National Electronic Injury Surveillance System, fireworks-related injuries accounted for an estimated 12,400 emergency room visits during 1990 in the United States (*1*); two thirds of fireworks-related injuries occur during the 4-week period surrounding Independence Day. Since 1986, to better characterize fireworks-related injuries and to improve local health education and prevention efforts, the Marion County (Indiana) Health Department (MCHD) has conducted surveillance of fireworks-related injuries. This report summarizes surveillance results for 1986–1991.

Marion County (1990 population: 797,159) includes metropolitan Indianapolis. Each year, the MCHD collects data on demographic characteristics of injured persons, nature of the injury, type of device, and circumstances surrounding the incident (e.g., adult presence at time of injury) from all eight area hospital emergency rooms from June 27 through July 11.

During the 6-year period, 159 persons were reportedly injured by fireworks in Marion County. Fewest injuries (16) occurred during 1988; injuries peaked (37) during 1990. Most injuries (76 [48%]) occurred among children and adolescents aged <15 years; 32 (20%) occurred among adolescents and young adults aged 15–24 years, and 45 (28%), among adults aged 25–44 years. Males accounted for 74% of the injuries.

Burns were the most common (127 [72%] of 177) type of fireworks-related injury reported; 11% of injuries were lacerations, 9%, abrasions, 2%, puncture wounds, and 6%, other injuries. By site of injury, hands/fingers were most commonly involved (61 [34%] of 177) followed by eyes (17%) and the face (12%); however, during 1988, eyes (seven [44%] of 16) were the most frequently reported site of injury.

Fireworks devices most often associated with injuries varied by age group. Among children <5 years of age, sparklers were the leading cause of injury (54%), followed by firecrackers (23%), bottle rockets (11%), twisters or "jumping jacks" (8%), and other devices (4%). Of all sparkler-related injuries, 42% occurred among children aged <5 years. For children aged 5–14 years, firecrackers (34%) ranked first, followed by twisters (18%), sparklers (16%), bottle rockets (14%), and other devices (18%); most injuries involving twisters (53%) occurred among persons in this age group. For young adults aged 15–24 years, bottle rockets (35%) and firecrackers (16%) combined caused more than half of the injuries. Adults aged 25–44 years were injured most frequently by bottle rockets (33%), firecrackers (28%), and sparklers (23%). Of the five persons aged ≥45 years, three were injured by firecrackers.

Fireworks-Related Injuries — Continued

The most frequent injury-causing event reported involving other fireworks-related devices was lighting gunpowder, which accounted for injuries to eight persons aged 15–24 years. During the 6-year period, 53% of minors injured by fireworks were under adult supervision at the time of the injury.

Reported by: DS Joseph, MS, Marion County Health Dept; ML Fleissner, DrPH, State Epidemiologist, Indiana State Board of Health. Unintentional Injuries Section, Epidemiology Br, Div of Injury Control, National Center for Environmental Health and Injury Control, CDC.

Editorial Note: Although use of commercial fireworks rarely results in injuries, the private use of fireworks during the Independence Day holiday period has been associated with an increasing trend of substantial injuries. The National Fire Protection Association (NFPA) used CPSC data to estimate that, in the United States, the average annual number of emergency room visits resulting from fireworks use increased at least 48% during 1986–1990, compared with 1974–1978 (*1*). The NFPA also characterized the substantial economic and public health impact resulting from fireworks: during 1988, fireworks accounted for an estimated 44,500 fires that resulted in 20 deaths and $41 million in direct property damage.

The demographic characteristics of persons most frequently injured by fireworks in Marion County are consistent with national findings and with previous studies from Washington state (*2–4*). Young males were most frequently injured; however, for fireworks—as well as for most other injury causes—it is not possible to determine whether young males are at increased risk for injury or whether their injury patterns reflect increased exposure to injury-causing events.

In Marion County, injuries were associated with every category of fireworks. The relation of age of person injured to type of fireworks device was also consistent with national findings. For example, sparkler injuries were a substantial problem for young children (*2*); adults were more likely to be injured by aerial devices such as bottle rockets. A previous report from Washington indicated that, among all age groups, fireworks-related injuries were associated with firecrackers and aerial devices and with a variety of misuse behaviors (e.g., relighting, throwing, holding in hand, and bending over to light). For children aged <16 years, lack of adult supervision was a significant risk factor for injury (odds ratio = 11.5; 95% confidence interval = 2.8–100.6) (*3*).

Current federal, state, and local laws regulating sales of fireworks to private persons are inconsistent and, therefore, undermine enforcement. For example, fireworks can be transported easily from legal to illegal jurisdictions. Increased availability of fireworks, legally or illegally, can increase related injuries. For example, during 1982, Washington standardized restrictions on fireworks sales to provide uniform availability of firecrackers and aerial devices statewide (*5*). Before the law change, explosive ground devices, aerial devices, and exploding firecrackers containing less than 50 mg of gunpowder were available only on American Indian reservations; the new law made these devices available outside reservations as well. As a consequence following the change in law, surveillance conducted by the Washington Department of Health documented a significant increase in the number of fireworks-related injuries reported by 15 hospitals in nine counties (from 39 in 1981 to 88 in 1982; $p<0.001$) (*5*).

Both legal and illegal fireworks are associated with injuries. During 1989, 73% of fireworks-related injuries reported through the CPSC system were associated with devices legally acquired under federal law (*2*). However, illegal fireworks may cause

Fireworks-Related Injuries — Continued

more severe injuries; during 1989, two thirds of injuries requiring hospitalization were associated with fireworks illegal under federal law (*2*).

In addition to stronger and more uniform restrictions on the availability of certain fireworks, educational efforts should also be employed to reduce injuries. For example, during the 1988 Independence Day holiday period, Marion County had the fewest number of fireworks-related injuries for 1986–1991; at the same time, however, a severe drought in Indiana prompted local public safety officials to discourage fireworks use—a message that was well publicized by the local media.

No fireworks should be considered completely safe for children. Educational efforts directed toward parents of young children have been effective in support of other injury-prevention campaigns such as the use of child safety seats. The American Academy of Pediatrics' Committee on Injury Prevention and Control recommends similar efforts to reduce injuries associated with sparklers and other fireworks that have special appeal to children (*6*). The CPSC has developed guidelines for parents living in areas that allow the sale of fireworks for personal use (see box) (*4*).

The MCHD provides its surveillance data to local media and interest groups (e.g., state and local fire marshals and state legislators) concerned with fireworks safety. In addition, all Marion County hospitals receive an overall report on the incidence of fireworks-related injuries and associated health-care concerns.

References

1. National Fire Protection Association. NFPA: fire facts. Quincy, Massachusetts: National Fire Protection Association, April 1991.

Recommendations to Parents Regarding Personal Fireworks Safety

- Do not allow younger children to play with fireworks under any circumstances. Remember that fireworks are not toys for children. The sparkler, considered by many as the ideal "safe" fireworks for the young, burns at very high temperatures and can easily ignite clothing. Children cannot appreciate the danger involved and cannot act correctly in the case of emergency.
- Closely supervise older children who are permitted to use fireworks. Do not allow any running or boisterous play while fireworks are being used.
- Before using any fireworks, read and follow all warning instructions printed on the label.
- Light fireworks outdoors in a clear area away from houses and flammable materials (e.g., gasoline cans).
- Keep a bucket of water nearby for emergencies and for dousing fireworks that do not go off.
- Do not try to relight or handle malfunctioning fireworks. Soak them with water and throw them away.
- Be sure other people are out of range before lighting fireworks.
- Never ignite fireworks in a container, especially a glass or metal container.
- Store fireworks in a dry, cool place. Check instructions for special storage directions.

Source: Consumer Product Safety Commission.

Fireworks-Related Injuries — Continued

2. National Fire Protection Association. NFPA: fire facts. Quincy, Massachusetts: National Fire Protection Association, April 1990.
3. McFarland LV, Harris JR, Kobayashi JM, Dicker RC. Risk factors for fireworks-related injury in Washington state. JAMA 1984;251:3251–4.
4. Berger LR, Kalishman S, Rivara FP. Injuries from fireworks. Pediatrics 1985;75:877–82.
5. CDC. Fireworks-related injuries—Washington. MMWR 1983;32:285–6.
6. Committee on Injury Prevention and Control, American Academy of Pediatrics. Children and fireworks. Pediatrics 1991;88:652–3.

Public Health Focus: Mammography

Among U.S. women, breast cancer is the most commonly diagnosed cancer and the second leading cause of death from cancer. From 1980 through 1987, the incidence of breast cancer increased from 94.6 to 124.3 per 100,000 women (age-adjusted to the 1990 U.S. population) (*1*). In contrast, death rates remained stable; during 1988, 31.1 per 100,000 U.S. women died from the disease (Table 1) (*2,3*). Although the prognosis for breast cancer is more favorable than for many other types of cancers, breast cancer continues to be an important source of years of potential life lost before age 65 (YPLL) (Table 1). White women account for 82% of all YPLL from breast cancer; however, the estimated rate of YPLL during 1988 was approximately

TABLE 1. Breast cancer prevalence, mortality, and years of potential life lost before age 65 (YPLL), by race; and length of hospital stay — United States

Disease burden (year of most recent data)	Number	Rate*
Prevalence (1987)†		
White	1,160,807	977.3
Black	101,189	800.6
Other	15,572	431.3
Total	**1,277,568**	**958.3**
Mortality (1988)§		
White	37,324	31.0
Black	4,467	34.8
Other	378	11.6
Total	**42,169**	**31.1**
YPLL (1988)		
White	185,478	205.3
Black	37,887	278.4
Other	3,378	80.8
Total	**226,743**	**207.5**
Hospitalization (1990)¶		
Discharged from short-stay hospitals	163,000	1.3
Average length of stay (days)	4.6	

*Per 100,000 women, age-adjusted to the 1990 U.S. population.
†Source: data from 1987 National Health Interview Survey, Cancer Supplement.
§Source: NCHS, underlying cause-of-death data. *International Classification of Diseases, Ninth Revision,* codes 174.0–174.9.
¶Source: data from National Hospital Discharge Survey, annual summary 1990.

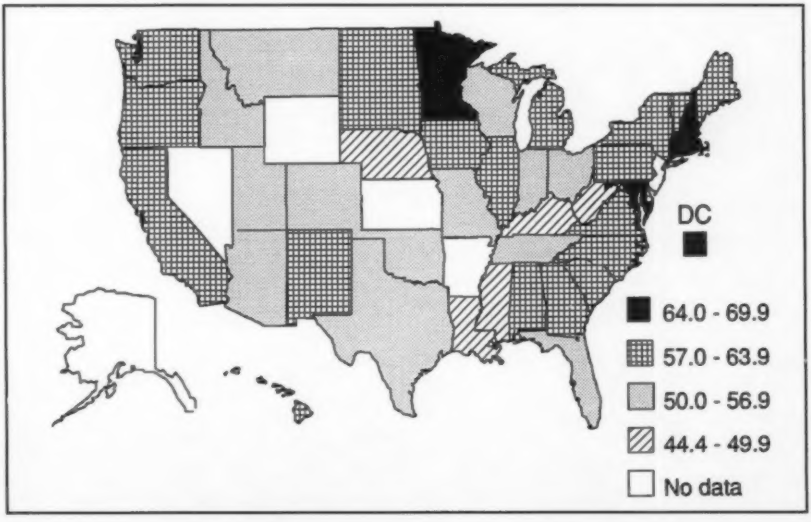
Mammography – Continued

25% higher for black women than white women. For breast cancer, certain primary risk factors (e.g., family history, age at menarche, and age at menopause) cannot be altered and others (e.g., parity and age at first pregnancy) are not practical targets for intervention. Therefore, as a secondary method for prevention of breast cancer, mammography screening is the most commonly recommended intervention. During 1990, 58% of U.S. women aged ≥40 years reported having had a screening mammogram within the preceding 2 years (Figure 1). This report summarizes information regarding the efficacy, effectiveness, and cost-effectiveness of mammography screening.

Efficacy

Results from large randomized clinical trials indicate that mammography screening has had favorable effects on breast-cancer mortality (Table 2). In these randomized trials that compared all women invited to screening (regardless of whether they participated) with an uninvited control group, mortality was reduced among women aged 50–69 years who were invited to screening. Among women who complied with the screening recommendations, calculations from the combined published data suggest a reduction in mortality of approximately 39% (*4*). These findings are consistent with studies with nonrandomized controls, comparisons to national rates, and several case-control studies on mammography screening. Although no studies have shown a statistically significant reduction in the risk for dying from breast cancer among women aged 40–49 years, more studies show a favorable trend for screening than studies showing no trend or harmful effects from screening for this age group (*5*).

FIGURE 1. Percentage of women ≥40 years of age who reported having had a mammogram within the preceding 2 years, by state – Behavioral Risk Factor Surveillance System, 1990



Mammography — Continued

Effectiveness

Data from the randomized trials have been used to estimate population mortality reductions that could be achieved through routine mammography programs (*6–9*). The estimated breast-cancer mortality reduction has ranged from 8% to 40%, reflecting different assumptions among the mathematical models about targeted age groups, screening intervals, sensitivity of the mammography, compliance with regular screening, and natural history of the disease. Among women who receive screening regularly, the mortality reduction should be substantially greater than these population estimates.

Cost-effectiveness

Estimates of the cost-effectiveness of mammography vary widely because of differences in methodologies, measures, assumptions, and the programs and policies evaluated. Factors affecting the estimates include the proportion of high-risk women screened, the sensitivity and specificity of the mammography technique, the interval between examinations, and the cost of each mammogram. In the Netherlands—where invitations were mailed to participants—the annual screening of women aged 50–69 years was estimated at a cost of $14,800 per life year gained (*6*). Simulated

TABLE 2. Summary of major controlled trials of breast cancer screening

Study location	Year of start	Age (yrs) at entry	No. women	Screening modality	Screening interval (months)	Follow-up (yrs)	Reduction in breast cancer deaths %	(95% CI*)
New York[†]	1963	40–64	62,000	Physical exam Mammography	12	10	29	(11–44)
Malmö, Sweden[§]	1976	45–69	42,000	Mammography	18–24	9	4	(–35–32)
Two-county, Sweden[¶]	1977	40–74	133,000	Mammography	21–33**	11	30	(15–42)
Edinburgh, Scotland[††]	1979	45–64	46,000	Physical exam Mammography	12–24[§§]	7	17	(–18–42)
Stockholm, Sweden[¶¶]	1981	40–64	60,000	Mammography	28	7	29	(–20–60)

*Confidence interval.

[†]Source: Shapiro S, Venet W, Strax P, et al. Ten-to-fourteen year effect of screening on breast cancer mortality. JNCI 1982;69:349–55.

[§]Source: Anderson I, Aspergren K, Janzon L, et al. Mammographic screening and mortality from breast cancer: the Malmö mammographic screening trial. Br Med J 1988;297:943–8.

[¶]Source: Tabar L, Fagerberg G, Gad A, et al. Reduction in mortality from breast cancer after mass screening with mammography. Lancet 1985;1:829–32.

**Respective average for 40–49-year and 50–74-year age groups.

[††]Source: Roberts MM, Alexander FE, Anderson TJ, et al. Edinburgh trial of screening for breast cancer: mortality at seven years. Lancet 1990;335:241–6.

[§§]Respective interval for physical examination and mammography.

[¶¶]Source: Frisell J, Eklund G, Hellstrom L, Lidbrink E, Rutqvist LE, Somell A. Randomized study of mammography screening—preliminary report on mortality in the Stockholm trial. Breast Cancer Res Treat 1991;18:49–56.

Mammography — Continued

models based on the United Kingdom experience that assumed relatively low sensitivity and participation rates estimated costs ranging from $4500 to $5500 per life year saved (*8*). Estimates using data from the U.S. Breast Cancer Detection Demonstration Project (BCDDP) (*9*) showed that annual screening of women aged 55–65 years with physical examination and mammography yielded a marginal cost of $22,000 per life year saved. Data from a 1960s trial that used less sensitive radiologic technology (the Health Insurance Plan of Greater New York [HIP]) indicated the estimated cost of saving one life year was ≤$84,000. For women aged >65 years, the estimated cost per life year saved ranged from $13,200 to $28,000. Estimates of the cost per life year saved among women aged 40–49 years ranged from $30,000 (BCDDP data) to $135,000 (HIP data) (*10*). However, screening programs with mortality reduction estimates as low as 8%–12% can be cost-effective (based on assumptions of lower sensitivity than shown in the most successful trials and participation rates of 50%–70%) (*6,8*).

The estimated annual cost of illness for breast cancer is $3.8 billion, including $1.8 billion for medical-care costs (converted to 1987 dollars) (*11*). During the 1980s, in place of radical mastectomies, modified radical mastectomy and breast-preservation techniques were increasingly performed and contributed to a reduction in the average number of hospital days associated with the treatment for breast cancer (in 1982, an average of 10.0 days compared with 4.6 days during 1990) (Table 1).

Reported by: A Elixhauser, Battelle, Arlington, Virginia. Div of Cancer Prevention and Control, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: Widespread mammography screening may explain, in part, the increasing breast-cancer incidence in the United States; however, this increase also occurred among population groups not covered by screening and among industrialized countries before mammographic screening had been widely implemented. Screening with either mammography alone or in combination with physical breast examination can reduce the disease burden from breast cancer by reducing both morbidity and mortality. Breast-cancer screening studies illustrate that 1) high-quality mammography is needed to ensure breast tumors are diagnosed at a stage early enough to reduce mortality and 2) quantitative measures are available and can be used to evaluate and improve screening programs (*12*).

Differences in sensitivity of the screening tests might explain some of the differences in mortality reduction in different screening trials. Although data are not available on mortality reductions obtained from routine mammography screening that are not part of research programs, preliminary data from extensive screening programs are available from Australia, the Netherlands, and Scandinavia. Overall results indicate that acceptable levels of sensitivity and specificity of mammography can be achieved and suggest that these programs may result in a future reduction of breast-cancer mortality. However, early results from the carefully monitored national program in Finland (*13*) indicate that the sensitivity of mammography is 25%–50% lower than that measured in the major screening trials, highlighting the difficulty in maintaining high-quality imaging and interpretation.

Age is considered the only practical criterion on which to base screening guidelines. Targeting screening to only women who have one or more of the established breast-cancer risk factors would allow for 20%–50% of breast cancers to remain undetected by screening and, therefore, would undermine the cost-effectiveness of screening. Because of reduced sensitivity of screening and a lower incidence of breast

Mammography – Continued

cancer among younger women, the cost-effectiveness of screening younger women is less favorable than for older women. Mammography screening trials have not convincingly demonstrated mortality reduction among women <50 years of age. However, if more sensitive screening methods are developed, the cost-effectiveness of screening younger women might be improved. In addition, the value of screening women aged ≥70 years has not been adequately addressed; whether cost-effective programs can be developed and successfully implemented for women aged ≥70 years must be determined.

In addition, the optimum interval for mammography screening has not been firmly established; the best estimates are based on indirect calculations (*14*). However, further data regarding this question of screening interval may be provided through long-term follow-up of the randomized clinical trials and mathematical modeling techniques and from a recently initiated clinical trial in the United Kingdom.

If routine screening programs are to have the favorable impact in reducing breast-cancer mortality as observed in randomized clinical trials, breast-cancer screening programs should have monitoring systems and require strict adherence to quality-assurance guidelines. Effective tracking and reminder systems must be an integral part of breast-cancer screening programs. In addition, if the benefits of early treatment are to be assured for women with a screening-detected cancer, physicians and health-care organizations must ensure timely referrals to diagnose and treat all women with abnormal screening results. Experiences from cervical cancer screening programs indicate that operational constraints on follow-up of abnormal screening exams can jeopardize the entire benefit of the program (*15*).

Mammography can be highly sensitive and specific, and can be provided at reasonable cost for widespread screening of asymptomatic women. In addition to the implementation of high-quality screening programs, however, evaluations of cost-effectiveness should be incorporated into these programs as well as additional research to better quantify the contribution of mammography screening in reducing mortality and morbidity in varied community settings.

References

1. National Cancer Institute. Cases diagnosed between 1973 and 1987 and intercensal population estimates by race, sex, and age [machine-readable public-use data tapes]. Bethesda, Maryland: US Department of Health and Human Services, Public Health Service, National Institutes of Health, 1990.
2. Irwin R. Intercensal estimates of the population by age, sex, and race [machine-readable public-use data tapes]. Alexandria, Virginia: Demo-Detail, 1980–1988.
3. NCHS. Vital statistics mortality data, multiple cause-of-death detail [machine-readable public-use data tapes]. Hyattsville, Maryland: US Department of Health and Human Services, Public Health Service, CDC, 1973–1988.
4. Day NE. Screening for breast cancer. Br Med Bull 1991;47:400–15.
5. Shapiro S. Periodic breast cancer screening in seven foreign countries. Cancer 1992; 69(suppl):1919–24.
6. Van der Maas PJ, de Koning HJ, van Ineveld BM, et al. The cost effectiveness of breast cancer screening. Int J Cancer 1989;43:1055–60.
7. Prorok PC. Mathematical models of breast cancer screening. In: Day NE, Miller AB, eds. Screening for breast cancer. Toronto: Hans Huber Publishers, 1988:95–104. (International Union Against Cancer monograph).
8. Knox EG. Evaluation of a proposed breast cancer screening regimen. Br Med J 1988;297: 650–4.
9. Eddy DM. Screening for breast cancer. Ann Intern Med 1989;111:389–99.
10. Eddy DM, Hasselblad V, McGivney W, Hendee W. The value of mammography screening in women under age 50 years. JAMA 1988; 259:1512–9.

Mammography — Continued

11. Scitovsky AA, McCall N. Economic impact of breast cancer. Frontiers of Radiation Therapy and Oncology 1976;11:90–101.
12. Day NE, Williams DRR, Khaw KT. Breast cancer screening programmes: the development of a monitoring and evaluation system. Br J Cancer 1989;59:954–8.
13. Hakama M, Elovainio L, Kajantie R, Louhivuori K. Breast cancer screening as public health policy in Finland. Br J Cancer 1991;64:962–4.
14. Tabar L, Fagerberg G, Day NE, Holmberg L. What is the optimum interval between mammographic screening examinations?—an analysis based on the latest results of the Swedish Two-County Breast Cancer Screening Trial. Br J Cancer 1987;55:547–51.
15. Anonymous. Cancer of the cervix: death by incompetence [Editorial]. Lancet 1985;2:363–4.

Errata: Vol. 41, No. 23

In the article, "Trends in Prostate Cancer—United States, 1980–1988" the first paragraph on page 402 should read "From 1980 through 1988, death rates increased *7.5%* for white men and *5.9%* for black men." The fourth sentence of the paragraph should read "The age-specific difference was greatest for men aged 50–54 years: in this age group, the death rate for black men was *3.2* times higher than that for white men (*11.3* per 100,000 versus *3.6* per 100,000)." The journal for reference 7 should read "*Cancer* (in press)". These changes do not affect the figures, tables, or conclusions.

In the article "Changes in Sexual Behavior and Condom Use Associated with a Risk-Reduction Program—Denver, 1988–1991," the first footnote to Table 1 on page 413 should read "Based on data from *12-month* visit."

The *Morbidity and Mortality Weekly Report* (*MMWR*) Series is prepared by the Centers for Disease Control and is available on a paid subscription basis from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402; telephone (202) 783-3238.

The data in the weekly *MMWR* are provisional, based on weekly reports to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the succeeding Friday. Inquiries about the *MMWR* Series, including material to be considered for publication, should be directed to: Editor, *MMWR* Series, Mailstop C-08, Centers for Disease Control, Atlanta, GA 30333; telephone (404) 332-4555.

☆U.S. Government Printing Office: 1992-631-123/67012 Region IV

DEPARTMENT OF
HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control
Atlanta, Georgia 30333

Official Business
Penalty for Private Use $300

A 48106SER 06 8639 9 N
SERIALS ACQUISITION DEPT
UNIVERSITY MICROFILMS
300 NORTH ZEEB ROAD
ANN ARBOR, MI 48106

FIRST-CLASS MAIL
POSTAGE & FEES PAID
PHS/CDC
Permit No. G-284

HHS Publication No. (CDC) 92-8017

Redistribution using permit imprint is illegal.